DENISOV, Yurii Mikhailovich; SHUL'TS, V.L., red.; CHEPELKINA, L.A., red.

[System for calculating the discharge hydrograph of mountain rivers] Skhema rascheta gidrografa stoka gornykh rek. Leningrad, Gidrometeoizdat, 1965. 102 p.
(MIRA 18:7)

USSR/Diseases of Farm Animals. Non-Contagious Diseases.   R-2

Abs Jour   : Ref Zhur-Biol., No 18, 1958, 83582

Author   : Denisov, Yu. M.
Institute   : Stavropol Institute of Agriculture
Title   : Treatment of Bronchopneumonia in Swine (The Author's
               Report).

Orig Pub   : Sb. nauchno-issled. rabot stud. Stavropol'sk, s.-kh.
               in-ta, 1956, vyp. 4, 137-139

Abstract   : No abstract is given

Card 1/1

33

KHEVELEV, E.M.; KRIVTSOV, K.S., kand. arkhitektury, nauchnyy red. Prinimali
uchastiye: BOGDANOV, I.M., inzh.; LOYKONEN, V.F., inzh.; VOLPYAN,
B.L., inzh.; DAVIDOVICH, L.N., kand. tekhn. nauk, retsenzent; DENI-
SOV, Yu.M., red.; ROZOV, L.K., tekhn. red.

[Design of city garages] Proektirovanie gorodskikh garazhei. Lenin-
grad, Gos. izd-vo lit-ry po stroit., arkhit. i stroit. materialam,
1961. 183 p.   (MIRA 14:10)
                        (Garages)

3.5150

S/169/62/000/005/046/093
D228/D307

AUTHOR: Denisov, Yu. M.

TITLE: Calculation of the daily total of direct solar ra-
               diation acting upon slopes

TEXT: An approximate analytical method is given for calculating
the daily total of direct solar radiation, acting upon slopes. The
problem is solved by means of the Fourier series, whose coeffi-
cients are found from an infinite system of equations that are li-
near in relation to the coefficients. /¯Abstracter's note: Com-
plete translation._7

Card 1/1

SAMBORSKIY, N.A.; DENISOV, Yu.M.

Using data from seismic prospecting in a paleotectonic analysis.
Neft. i gaz. prom. no.2:19-22 Ap-Je '63.

(MIRA 17:11)

1. Trest "Poltavaneftegazrazvedka".

L 15255-65   EWT(1)/FCC   GW
ACCESSION NR: AR4047658   S/0169/64/000/007/B046/B046

SOURCE: Ref. zh. Geofizika, Abs. 7B294

AUTHOR: Denisov, Yu. M.; Sofiyev, Ye. I.

TITLE: Movement of a pilot balloon in a turbulent flow

CITED SOURCE: Nauchn. tr. Tashkentsk. un-t, vyp. 225, 1963, 52-61

TOPIC TAGS: pilot balloon, atmospheric turbulence, wind velocity, wind fluc-
tuation, turbulent gust

TRANSLATION: An attempt has been made to determine theoretically the forces act-
ing on a pilot balloon system in flight and to obtain information on turbulent
gusts on the basis of the overloads which they cause. Taking into account that
the factors causing overloads can be oscillations of the balloon as well as tur-
bulent gusts, the authors consider the natural oscillations of the balloon around
some point within the balloon, oscillations of the radiosonde on the suspension
near the neck and the vibration of the neck. The initial prerequisite for des-
cribing the interaction between the pilot balloon and a turbulent gust is the as-
sumption of the effect on the pilot balloon of a force computed using Newton's
formula for a body surrounded by an air flow. In order to obtain a solution the
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ACCESSION NR: AR4047658

authors also introduced the following simplifying assumptions: 1) the pilot
balloon is entrained completely by a horizontally averaged air flow; 2) the
vertical component of mean air velocity is much less than the vertical velocity
of the balloon: 3) at low velocities and with a short period of effect of tur-
bulent gusts, the fluctuating velocity of the pilot balloon can be neglected in
comparison with the same for the air; 4) the horizontal projections of instan-
taneous acceleration of a pilot balloon are equal to zero. These assumptions
make it possible to determine the relationship between the vertical components
of fluctuations of air velocity and overloads, although only when there is a
short duration of effect of the fluctuations (on the order of 1 second), that is,
for dimensions of vertical currents less than 10 m vertically. In addition, de-
termination of the vertical components of fluctuations is basically ambiguous due
to oscillations of the radiosonde on the suspension. Computation of the vertical
wind fluctuations from overload records can yield only some probable data. Ac-
cording to the authors' estimates, the periods of parasitic overloads arising due
to the oscillations are half as great as the period of oscillations of the system
and are about 0.5, 9.8 and 2 seconds, that is, are close to the time intervals
between actual gusts in the turbulent zone. This makes it very difficult to de-
tect a useful signal and make a quantitative analysis of specific results. A
certain integral characteristic is proposed by the authors for evaluation of tur-
bulent intensity. R. Pastushkov.
Card 2/3

L 15255-65
ACCESSION NR: AR4047658

ASSOCIATION: Tashkentskiy universitet (Tashkent University)

SUB CODE: ES   ENCL: 00

Card 3/3

26,5000

69933

S/024/59/000/06/010/028
E081/E241

AUTHORS: Denisov, Yu. N., Troshin, Ya. K., and Shchelkin, K.I.
(Moscow, Novosibirsk)

TITLE: The Analogy Between Combustion with Explosive Waves
and (Combustion) in a Rocket Engine

PERIODICAL: Izvestiya Akademii nauk SSSR, Otdeleniye
tekhnicheskikh nauk, Energetika i avtomatika, 1959,
Nr 6, pp 79-89 (USSR)

ABSTRACT: The paper is a continuation of previous work (Refs 1, 2,
6, 7, 12, 13, 14, 17). The combustion chamber of a
rocket engine is regarded as a cylindrical tube (Fig 1a).
The fuel and oxidant is fed through the head 2 and forms
the mixture in zone 1. After chemical conversion of the
initial fuel in the combustion zone 2, gaseous products
are formed in zone 3. [Fig 1, - a: scheme of combustion
chamber; b: pressure diagram in schematic plane of
explosive waves; c: schematic representation of a
disturbance in the ignition zone] The original state
of the material is characterised by the initial
parameters: pressure p_1, density ρ_1, temperature T_1,
and flow velocity u_1, and by final parameters:

Card 1/5 pressure p_3, density ρ_3, temperature T_3 and flow

The Analogy Between Combustion with Explosive Waves and Combustion in a Rocket Engine

velocity u_3. Q is the energy evolved in passing from the initial to the final state. These quantities are connected by the Hugoniot equation (top of p 80), in which $\varkappa = (\gamma + 1/\gamma - 1)$ where γ is the ratio of specific heats c_p/c_v. The Hugoniot is shown in Fig 2. [Hugoniot adiabatics. For descriptiveness both branches of the adiabatics EM and KM are represented by the same energy evolution Q which is independent of the initial pressure of the reacting mixture] in coordinates p, V, where $V = 1/\rho =$ specific volume. Analysis of the physical significance of the branches of the Hugoniot curve shows that the deflagrational portion KA (Fig 2) can be regarded as the geometrical locus of points each of which corresponds to a given amount of boost of the combustion process in a rocket engine. It is shown that this process may be unstable, the instability being determined by Eq (5) in which ΔT is the temperature change of the gas in the disturbed region and τ is the induction period of ignition. The variation of τ with

Card 2/5   temperature is given by Eq (6), where E is the $\sqrt{}$

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S/024/59/000/06/010/028
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The Analogy Between Combustion with Explosive Waves and Combustion in a Rocket Engine

activation energy and R is the gas constant. If the constant k is independent of temperature and pressure, the criterion for instability of the plane ignition zone in explosive waves in Eq (7) or in terms of pressure, Eq (8). Calculation shows that instability exists for many gaseous explosive mixtures, and leads to high frequency vibrations (Fig 3 - spin explosion). Figs 4 and 5 show the so-called normal explosion (Fig 4 taken with a low resolving power equipment; Fig 5 taken with higher resolving power equipment; mixture $2H_2 + O_2$, $p_0 = 760$ mm Hg, magnification along the z axis: $G = 3$, time axis 1 mm = 1 μsec; in Figs 3, 4, and 5 the z axis is horizontal and the time axis vertical). Fig 5 shows periodic inhomogeneities in the explosive wave front. These were further investigated by means of a deposit of soot on the inside of a glass tube in which the explosion took place and left the traces shown in Fig 6. (Step trace of a pulsating explosion. Mixture $2H_2 + O_2$, $p_0 = 300$ mm Hg, $d = 16$ mm, $G = 5$; propagation direction of explosive waves from bottom to

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S/024/59/000/06/010/028
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The Analogy Between Combustion with Explosive Waves and Combustion in a Rocket Engine

top; the arrows show the tracks of periodic explosions; d is the diameter of the tube.) Analysis of experimental results shows that there are two types of explosive wave, spin (Fig 3, 7a, 6) and pulsating (Fig 78, 6) (Fig 7: step traces in explosive mixtures $2H_2 + O_2$, a,6: Spin $p_0 = 50$ mm Hg, d = 16 mm, G for a = 1.3, for 6 = 2.25; 6 pulsating with n = 2, $p_0 = 130$ mm Hg, d = 11 mm, G = 2.5.) These two types of wave are illustrated in Fig 8, together with graphs showing numerical results. (Fig 8. Dependence of the explosive wave parameters on initial pressure in the reacting mixture (mixture $2H_2 + O_2$; d = 16 mm). a - explosive velocity D and the mean temperature in the wave T_A; 6 - form of the leading front of the explosive waves at times t_1 and t_2; I - spin; II - pulsating with the number n of pulsations round the contour of the tube = 1; III pulsating with n = 2; 6 - frequency and number of pulsations n. Experimental points obtained by the photographic method plotted as squares; remaining points obtained by the trace method.) The criterion for

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The Analogy Between Combustion with Explosive Waves and Combustion
in a Rocket Engine

combustion instability in a rocket engine chamber is
written in the form (9), where $\triangle p$ is the drop in
pressure per unit length of the chamber caused by
combustion. The criterion (9) can be written approximately
in the forms (10) and (10a). With sufficiently large
γ, E, $\triangle p$, M_1 (Mach number), Q, and sufficiently
small T_1 and p_1, the left hand side of (10) and (10a)
may attain values of order unity. The stability of
combustion front is then disturbed, and pulsations
arise in it. The analogy discussed above between high
frequency vibrations in a combustion chamber and in an
explosion suggests that pulsations in these processes
may have a similar nature and mechanism. There are
8 figures and 17 references, 13 of which are Soviet and
4 English.

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR. Institut
khimicheskoy kinetiki i goreniya SO AN SSSR (Institute of
Chemical Physics, Ac. Sc. SSSR and Institute of Chemical
Kinetics and Combustion, SO Ac. Sc. SSSR)

SUBMITTED: June 13, 1959

10(3)

AUTHORS: Denisov, Yu. N., Troshin, Ya. K.   SOV/20-125-1-29/67

TITLE: Pulsating and Spin Detonation of Gas Mixtures in Pipes
(Pul'siruyushchaya i spinovaya detonatsiya gazovykh
smesey v trubakh)

ABSTRACT: The present paper deals with the experimental investigation
of the detonation-wave structure of a gas in a pipe. The
time course of the process was recorded by photography and
moreover, it was investigated by the "tracer method". When
applying this method a "trace" is fixed, that is left over
in the interior of the preserved detonation pipe by the
irregular dynamic pressure at the front. For this purpose
the vitreous detonation pipe was internally covered with a
thin layer of soot. According to the results shown by the
photographic recording, the detonation structure is changed
from normal to a spin detonation, namely, depending on how
the initial pressure of the explosive gas mixture varies with
unchanged composition and given pipe diameter The authors
therefore investigated the detonation with different initial

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Pulsating and Spin Detonation of Gas Mixtures in Pipes SOV/20-125-1-29/67

pressures p_0 of the stoichiometrically balanced oxygen mixtures with hydrogen, methane and acetylene. A normal detonation is usually observed in such mixtures at atmospheric pressure. With higher resolving power of the recorder, however, photographs of such an explosion wave exhibit the characteristic features of a spin detonation, namely, a striated structure of the afterglow and a wavy front line. By the tracer method rhomboid impressions on the pipe wall are observed, which are indicative of pulsating variations of the dynamic pressure at the detonation front in the presence of a high-frequency multihead spin. An analysis of the experimental data leads to the following conclusions: The screw-shaped and rhombic traces on the pipe walls are recorded by the points of discontinuity of the detonation-wave front (oblique compression jumps in which the reaction chiefly takes place). Apart from these points of discontinuity, also intense disturbances are recorded by the tracer method in a multihead-spin detonation, i. e. a flashing up that seizes the front periodically and very rapidly in the intervals

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Pulsating and Spin Detonation of Gas Mixtures in Pipes   SOV/20-125-1-29/67

between the adjacent points of discontinuity. This points
to the discreteness and steadiness of such a detonation.
The second figure illustrates the dependence of some
parameters of the detonation wave on the initial pressure
of the mixture. The front of the detonation wave is
nonplanar and the actual curvature of the front is even
larger than the recorded one. In the case of a multihead-spin
detonation the front varies periodically in a coordinate system,
which moves progressively with the mean velocity of the
detonation wave. The results obtained from these considerations
point to the possibility of subdividing the gas detonation in
pipes into a pulsating and a spin process. The characteristics
of both these types of detonation waves are shown in a table.
The results of the work under review point to the periodic
distribution of the chemical reaction within the individual
ranges of the detonation-wave front. The authors thank
Professor K. I. Shchelkin, Corresponding Member, AS USSR, for
having discussed the present paper and for useful
suggestions made.

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SOV/20-125-1-29/67

Pulsating and Spin Detonation of Gas Mixtures in Pipes

There are 3 figures, 1 table, and 9 references, 5 of which are Soviet.

ASSOCIATION: Institut khimicheskoy fiziki Akademii nauk SSSR
(Institute of Chemical Physics of the Academy of Sciences, USSR)

PRESENTED: November 26, 1958, by Ya. B. Zel'dovich, Academician

SUBMITTED: November 15, 1958.

Card 4/4

DENISOV, Yu.N.; TROSHIN, Ya.K.

Mechanism of combustion by detonation.- PMTF no.1:21-35 My-Je '60.
(MIRA 14:8)

(Combustion) (Detonation)

DENISOV, Yu.N.

28374
S/124/61/000/008/019/042
A001/A101

11. 8300

AUTHORS: Denisov, Yu.N., Troshin, Ya.K., Shchelkin, K.I.

TITLE: On a certain analogy between burning in a rocket engine and in a detonation wave

PERIODICAL: Referativnyy zhurnal. Mekhanika, no. 8, 1961, 36, abstract 8B221 (V sb. "3-ye Vses. soveshchaniye po teorii goreniya. T.1". Moscow, 1960, 193 - 199)

TEXT: Without considering physico-chemical processes in the combustion chamber of a rocket engine, the authors identify the burning zone in the rocket engine chamber with the zone of strong discontinuity in which a substance goes over from the initial state into the final state at the expense of energy liberation. The state of perfect gas formed at fuel evaporation is assumed for the initial state. In this schematization, operational conditions of rocket engines are represented by Gugonio adiabatic curve (its lower branch). Based on a certain analogy of burning in a rocket engine and in a detonation wave, the authors apply to burning in the rocket engine the criterion of instability of the plane front of burning at detonation

Card 1/2

On a certain analogy ...

28374
S/124/61/000/008/019/042
A001/A101

$$\frac{d\tau}{dT} \Delta T > \tau$$

(where ΔT is gas temperature change in the disturbance zone), delay of ignition τ is connected with temperature by the equation $\tau = K e^{E/RT}$. These relations, together with the Gugonio adiabatic curve with heat supply q, yield the following condition for excitation in the rocket engine of oscillations with frequency $\nu = (1/\tau) (d/2 \lambda)^2$:

$$(\gamma - 1)^2 \frac{E}{RT_1} \frac{M_1^2 q}{a_1^2} \gg 1$$

Here τ and λ are certain delay time and width of the burning zone, d is chamber diameter, M_1 is Mach number for gas before the burning zone.

K. Artamonov

[Abstracter's note: Complete translation]

Card 2/2

30967
S/124/61/000/009/008/058
D234/D303

11.8300

AUTHORS: Denisov, Yu.N. and Troshin, Ya.K.

TITLE: Thermo-gas-dynamic model of a pulsating detonation

PERIODICAL: Referativnyy zhurnal. Mekhanika, no. 9, 1961, 15,
                abstract 9 B81 (V sb. "3-ye Vses. soveshchaniye po
                teorii goreniya", v. 1, M., 1960, 200-207)

TEXT: A thermo-gas-dynamic model of a pulsating detona-
tion is offered. The opinion of the authors is that the results of
calculations according to this model are the second approximation
to the calculation of the three-dimensional process, if one assumes
the one-dimensional hydrodynamical theory of detonation as the first
approximation. The authors start from the idea of oblique collision-
al jumps being decisive in the mechanism of propagation of pulsating
detonation, while in a spin detonation the independent existence of
an oblique jump of detonation is possible. Results of data process-
ing are given for experiments on detonation of the mixture $2H_2 + O_2$

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Thermo-gas-dynamic model...

30987
S/124/61/000/009/008/058
D234/D303

which show that the mechanism of propagation of detonation combustion consists in the periodical formation of double reflection in the wave (during collision of oblique jumps of condensation) and disturbance of this reflection by perturbation from the chemical reaction of self-ignition caused by it. ⎾Abstracter's note: Complete translation⎦

Card 2/2

S/057/60/030/04/08/009
B004/B002

AUTHORS: Denisov, Yu. N., Troshin, Ya. K.

TITLE: The Gas Detonation Structure in Pipes

PERIODICAL: Zhurnal tekhnicheskoy fiziki, 1960, Vol. 30, No. 4,
              pp. 450-459

TEXT: The authors investigated the course of detonation propagation in
pipes in one direction, and also in the collision of two detonations
having opposite directions, by means of slow-motion and Mach's track meth-
od (fixation of detonation wave tracks in the pipe by means of carbon
black). The photorecorder of type ЖФР-1 (ZhFR-1) designed by the
IKhF AN SSSR (Institute of Chemical Physics of the AS USSR), was used for
the slow-motion picture. The detonation took place at different initial
pressures in stoichiometrical mixtures of H, CH_4, C_2H_2 with O_2, and

C_2H_2 with O_2 and Ar. The scheme of the test apparatus is shown in

Fig. 1. Figs. 2-5, 8, 9 show the slow-motion pictures and tracks of
carbon black. Fig.6 gives the dependence of the characteristic detonation

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The Gas Detonation Structure in Pipes   S/057/60/030/04/08/009
                                               B004/B002

wave values on the initial pressure, and Fig. 7 gives schemes of
different detonation wave structures. The authors obtained the result
that the front of the detonation is not plane, and that the bends of
this front play a leading part in the propagation of chemical reactions.
The detonation can be divided into a spin detonation and a pulsating
detonation. The wave propagation of the chemical reaction in the pulsat-
ing detonation has a periodic character. The spin detonation is
considered to be a limiting case of the pulsating detonation. The
tangential component and the frequency of the spin detonation could be
determined by means of the track method. A table gives the character-
istic features of spin and pulsating detonations. The chemical reactions
are periodical and localize in individual sections of the wave front. The
authors thank Professor K. I. Shchelkin, Corresponding Member of the
AS USSR for discussions. There are 9 figures, 1 table, and 15 references:
10 Soviet, 3 British, 1 German, 1 Austrian, and 1 French.

/C

Card 2/3

The Gas Detonation Structure in Pipes   S/057/60/030/04/08/009
                                               B004/B002

ASSOCIATION: Institut khimicheskoy fiziki AN SSSR (Institute of Chemical
            Physics of the AS USSR). Institut khimicheskoy kinetiki i
            goreniya CO AN SSSR (Institute of Chemical Kinetics and
            CO Combustion of the AS USSR)

SUBMITTED: January 26, 1959

Card 3/3

L 34363-66

ACC NR: AP6022212   SOURCE CODE: UR/0115/66/000/005/0089/0090

AUTHOR: Vasilevskaya, D. P.; Denisov, Yu. N.; D'yakov, N. I.

ORG: none

TITLE: Hall magnetometer

SOURCE: Izmeritel'naya tekhnika, no. 5, 1966, 89-90

TOPIC TAGS: magnetometer, Hall effect, magnetic field measurement

ABSTRACT: The magnetometer described (see Fig. 1) was developed at the Joint Insti-
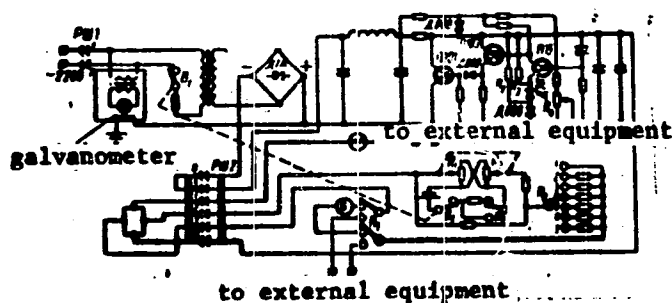tute of Nuclear Research. The device is based on the Hall effect and is designed for

Fig. 1. Schematic diagram of Hall
magnetometer

galvanometer

to external equipment

to external equipment

Card 1/2   UDC: 621.317.444

L 34363-66

ACC NR: AP6022212 $\mathcal{A}$

measuring stationary magnetic fields and for determining their configurations. The device uses two InAs Hall pickups (5 x 3 x 0.2 mm in size) and is placed between felt paddings in ebonite housings 80 x 20 x 15 mm in dimensions. The sensitivity of the pickups is approximately 0.0015 μv/tesla and their longitudinal and transverse resistances are approximately 2 ohms. Power supply is provided from a stabilized d-c source, which has a voltage stabilization coefficient of 1000, a load stabilization coefficient of 500 and whose load current drift does not exceed $\pm 2\cdot 10^{-3}\%$. The comparison circuit uses a P15 triode, while a P103 silicon transistor is used in the additional amplifying stage. The voltage drop across avalanche diode D808 is used as reference voltage. The excitation current is regulated by potentiometer R_4 within 50—150 mamp. The entire range of measured magnetic fields of 0—2 tesla is subdivided into 7 bands. Switch P_2 sets the desired measurement band. The maximal sensitivity of the device is $1.2\cdot 10^{-5}$ tesla with the "operating" and $0.83\cdot 10^{-5}$ tesla with "stand-by" pickup per one division on the galvanometer scale. When Hall emf is measured with the M95 galvanometer the error of magnetic field measurements is $\pm 0.8\%$. However, when Hall emf and the excitation current are controlled by the R307 potentiometer, the RMS measurement error is reduced to $\pm 0.3\%$. The authors thank I. A. Kaplin and P. P. Gavrish for their assistance in the development of the instrument.

Orig. art. has: 1 figure.   [DW]

SUB CODE: 09/ SUBM DATE: none/ ORIG REF: 002/ ATD PRESS: 5033

Card 2/2

L 41189-66

ACC NR: AP6022015   SOURCE CODE: UR/0120/66/ /003/0152/0155

AUTHOR: Denisov, Yu. N.; Kalinichenko, V. V.

ORG: Joint Nuclear Research Institute, Dubna (Ob"yedinennyy institut yadernykh issledovaniy)

TITLE: Broadband absorption chamber for observing EPR in the centimeter band

SOURCE: Pribory i tekhnika eksperimenta, no. 3, 1966, 152-155

TOPIC TAGS: EPR, magnetic field measurement, centimeter wave, RECTANGULAR WAVEGUIDE

ABSTRACT: An absorption chamber (see Fig. 1) in the form of a shortcircuited rectangular waveguide has been used for observing EPR; it requires a fairly large specimens however. The specimen volume can be reduced by one order of magnitude if a π-type waveguide (see Fig. 2) is used.
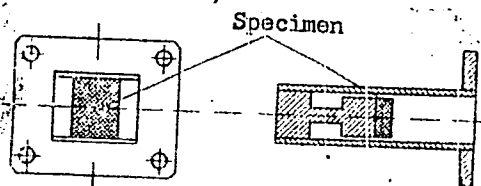
Fig. 1. Rectangular-type-waveguide absorption chamber

Fig. 2. π-type-waveguide absorption chamber

Card 1/2   UDC: 539.28.078
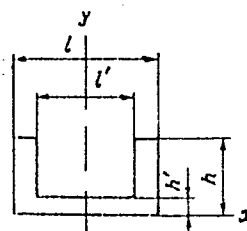
ACC NR: AP6022015

An approximate formula was developed for the transverse component of magnetic field $TE_x (x, y, z)$ necessary for determining the EPR signal. The formula was verified with a 16.6—40-Gc absorption chamber."The authors wish to thank I. A. Kaplin and Kh. F. Salakhatdinov for building the chambers and other waveguide elements."
Orig. art. has: 4 figures and 11 formulas.   [03]

SUB CODE: 20, 09 / SUBM DATE: 17Jun65 / ORIG REF: 007/

ACC NR: AP7000057   SOURCE CODE: UR/0207/66/000/005/0117/0119

AUTHOR: Denisov, Yu. N. (Moscow)

ORG: none

TITLE: Experimental determination of the polytropic exponent for gas detonation products

SOURCE: Zhurnal prikladnoy mekhaniki i tekhnicheskoy fiziki, no.5,1966, 117-119

TOPIC TAGS: detonation, gas detonation, combustion, detonation wave

ABSTRACT: Experiments to determine the polytropic exponent γ of gas detonation products were made by photographically measuring the angle between the reflected and incident detonation waves at the point of collision of two detonation waves. The experiments were conducted in the test assembly shown in Fig. 1.

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ACC NR: AP7000057.
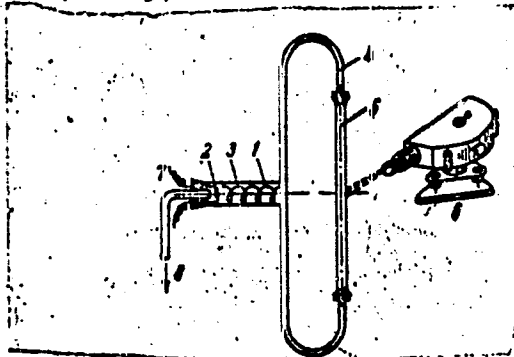
Fig.1. Diagram of ring-shaped detonation tube.

1-Metal tube in which the detonation is initiated; 2-wire spiral, for electric heating of the mixture; 3-Shchelkin spiral; 4-ring-shaped metal tube; 5-test section. The calculated values of γ were found to be:

Mixture	$2H_2 + O_2$	$CH_4 + 2O_2$	$C_2H_2 + 2.5O_2$	$C_2H_2 + 2.5O_2 + 2.5Ar$
γ	1.225 ± 0.025	1.245 ± 0.015	1.10 ± 0.03	1.225 ± 0.022

The addition of argon increased the value of γ for an acetylene-oxygen

Card 2/3

ACC NR:AP7000057

mixture. Orig. art has: 3 figures and 6 formulas.   [WA-88]

SUB CODE: 21/ SUBM DATE: 03May65/ ORIG REF: 008/ OTH REF: 000

Card 3/3

DANILOV, YU. N.

17. **Extraction Methods in Joint Institute's Synchrocyclotron Described**

"Extraction of a Proton Beam From the Six-Meter Synchrocyclotron by Excitation of the Radial Oscillations," by V. S. Katyshev, I. P. Dmitriyevskiy, V. I. Danilov, Yu. N. Denisov, N. L. Zaplatin, A. A. Kropin, and A. V. Chestnoy, Joint Institute of Nuclear Research, Pribory i Tekhnika Eksperimenta, No 1, Jan/Feb 57, pp 11-14

"Describes a new method developed for extracting charged particles from the chamber of the 6-meter synchrocyclotron of the Joint Institute of Nuclear Research. The theoretical and experimental research which was done included generation of local nonhomogeneities in the magnetic field intensity of the electromagnet, calculation and shimming of the magnetic conduit, and focusing of particles.

"Application of the method described gave an extraction factor of ~6% for 680 Mev protons at an emission rate of $7 \cdot 10^{10}$ particles per second." -- Authors' abstract

"A discussion of radial oscillations and scattering of particles in the magnetic conduit, a calculation of the magnetic field in zones of nonhomogeneity, and the results of experiments made in the period 1954-1955 are given. (U)

AUTHOR: Danilov, V. I., Denisov, Yu. N. and Dmitriyevskiy, V. P.   120-2-21/37

TITLE: A Differential Electronic Fluxmeter.. (Differentsial'nyy
Elektronnyy Flyuksmetr.)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, No.2,
pp. 74 - 77 (USSR).

ABSTRACT: An instrument for measuring sharply inhomogeneous magnetic
fields is described. The probe element consists of two
calibrated coils wound in opposition and differing in their
characteristics by not more than 0.002%. The rotation
of coils, which are both wound on the same former, is
achieved with the help of a special current excited wind-
ing. The electronic part of the arrangement consists of
an integrating network, of an inductively coupled amplifier,
of a peak reading voltmeter and of a remote control
arrangement. The characteristic constant of the instrument
was determined from measurements on a known magnetic field
using Equation 4, where N is the flux meter reading. The
sensitivity obtained for an instrument, built at the
Institute, was 0.027 oersted/cm/division. A mechanical
drawing of the coil arrangement and a circuit diagram of
the electronic part of the instrument are given. There
Card 1/2 are 2 Slavic references.

Joint Inst. Nuclear Research.

SOV/120-58-5-16/32

AUTHOR: Denisov, Yu. N.

TITLE: Universal Nuclear Magnetometer (Universal'nyy yadernyy magnitometr)

PERIODICAL: Pribory i tekhnika eksperimenta, 1958, Nr 5, pp 67-70 (USSR)

ABSTRACT: Magnetometers based on the phenomenon of nuclear magnetic resonance have been widely used in recent years (Refs.1-5). However, all these instruments can only be used to measure very homogeneous magnetic fields. The particular property of the present magnetometer is that it may be used to measure with high accuracy the intensity of strongly non-homogeneous magnetic fields. The admissible non-homogeneity in the region of the element of the magnetometer may be 4 to 5% of the field intensity. In addition, the instrument may be used in "continuous" measurements since the volume of the specimen in which the nuclear magnetic resonance is detected is only 0.001 cm^3. In the measurement of azimuthally symmetric magnetic fields the minimum radial size of the

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SOV/120-58-5-16/32

Universal Nuclear Magnetometer

element is 0.1 mm. The range of the fields is 300 to 20 000 oersted. The signal from the magnetometer is roughly proportional to the square of the field and so it cannot be used below 200 to 300 oersted. It is well-known that when magnetic fields are measured, using nuclear resonance, the experimental error is made up of the error in the determination of the gyromagnetic ratio γ and the errors involved in the determination of the frequency of the generator and the mid-point of the resonance line. The values of the coefficient of proportionality K which connects H and f_p have been determined with sufficient accuracy for many substances. For the protons in water, $K = 2.3486 \times 10^{-4}$. The frequency of the generator can easily be measured with an accuracy of $10^{-5} f_p$. If the specimen is made of water with a small addition of paramagnetic ions, then in uniform magnetic fields the width of the resonance line ΔH_L does not exceed tenths of oersteds. However, in the case of non-uniform fields the accuracy may be insufficient. The limiting factor in this case is the widening of the resonance line due to the non-uniformity of the field within the volume

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Universal Nuclear Magnetometer

of the specimen and the use of concentrated paramagnetic as well as with a wide resonance line. When the form of the line is very reproducible the accuracy may reach $0.1\,\Delta H_L$.

In the case of an azimuthally symmetric magnetic field, in the presence of a gradient dH_z/dr , the size of the specimen in the radial direction (δ) should be chosen so that $\delta \times dH_z/dr$ should not exceed the admissible line width.

For example, when H_z = 10 000 oersted, dH_z/dr = 400 oerst/cm and the accuracy of measurement = 0.01%, δ should be 0.25 mm. Experiments have shown that, using a phase detector, such an accuracy may be achieved with even greater gradients. A block diagram of the instrument is shown in Fig.1 and the basic circuit in Fig.2. In distinction to the instruments described in Refs.1-5, in the present instrument the detector of nuclear resonance and the low frequency pre-amplifier are mounted directly in the portable probe

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SOV/120-58-5-16/32

Universal Nuclear Magnetometer

placed in the gap of the magnet. This means that it can be used with electromagnets of any form or dimensions. The exclusion of long leads between the generator and the coil with the specimen means that the noise level may be reduced. To reduce the effect of the strong magnetic field on the probe, the latter includes radio tubes with plane electrode construction. The size of the probe in the vertical direction may be between 12 and 21 mm, depending on the magnetic field. To measure the field in very small gaps, an element with a demountable coil in a tube with an outer diameter of 4 mm is used. The modulation of the measured field is produced by two coils working as a Helmholtz pair. There are 4 diagrams, 1 table and 5 references, 2 of which are English and 3 Soviet.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (United Institute for Nuclear Studies.

SUBMITTED: November 21, 1957.

Card 4/4

DENISOV, Yu. N. Cand Tech Sci -- (diss) "Measuring and stabilization of magnetic fields of accelerators with spatial variation of the field." /Dubna/. 12 pp (Joint Inst of Nuclear Studies. Laboratory of Nuclear Problems), 170 copies. Printed by duplicationg machine. (KL, 41-59, 104)

-24-

AUTHOR: Denisov, Yu. N.

TITLE: A Nuclear Paramagnetic Resonance Stabilizer for Magnetic Fields (Stabilizator magnitnogo polya, osnovannyy na yavlenii yadernoy induktsii)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 1, pp 96-100 (USSR)

ABSTRACT: The nuclear induction head in this stabilizer contains 0.05 cc of an $M/4$ solution of ferric sulphate in water. The high-frequency power source contains a crystal-controlled oscillator and a tunable parametric oscillator. The two oscillators cover the range 0.8 to 1.2 Mc/s; frequency multipliers are fitted to cover the field range 1500 to 20 000 oersted. A low-frequency modulation field (450 c/s) is used in conjunction with a phase-sensitive detector to provide a control signal for the field-correcting unit. The overall stability is about 2 parts in 10^5. Fig 1 shows the block diagram of the device; Fig 2 shows the general circuit of the stabilizer (including the cathode-ray monitor). Fig 3 shows the head unit, and Fig 4 the construction of the coils; Fig 5 shows the unit that feeds the auxiliary coils on the magnet. The table lists the diameters of the poles of some magnets the device has been used with, the stability of the

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SOV/120-59-1-24/50

A Nuclear Paramagnetic Resonance Stabilizer for Magnetic Fields
current in the main coils (in %), the resulting field
stability, and the stabilization factor. The paper con-
tains 5 figures, 1 table and 6 references, of which 2 are
Soviet and 4 English.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Combined
Institute of Nuclear Studies)

SUBMITTED: February 10, 1958.

Card 2/2

SOV/120-59-2-47/50

AUTHORS: Denisov, Yu.N., and Osetinskiy, G.M.

TITLE: Electromagnetic Current Stabilisation
           (Stabilizatsiya toka elektromagnita)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 2,
           pp 148-150 (USSR)

ABSTRACT: The block diagram of the stabiliser is in Fig 1.   The
           resistance R_{w} in series with the main D.C. feed to
           the coils is chosen so that the nominal voltage drop
           across it is 1.5 V.   This voltage is further divided
           down and compared with a standard cell type ZS-L-30
           using a 4-decade potentiometer. The unbalanced output
           is converted to A.C. by a vibrator and amplified in the
           chopper amplifier in Fig 2. The overall D.C. gain is
           $(3-5) \times 10^3$.   The enhanced level of voltage is now used
           to control the field exciting current of the generator
           feeding the magnet. When the excitation is less than
           3 amperes the simple series regulator of Fig 3 is used.
           The current passes through a number of 6N5S valves
           connected in parallel. Their grids are controlled by
           a 6Zh1P voltage amplifier, giving typically a regulation
Card 1/3   characteristic of 40 milliamperes per volt. When the
    2

Electromagnet Current Stabilisation   SOV/120-59-2-47/50

excitation is greater than 3 amperes the 3-phase
thyratron scheme of Fig 4 is used. Valves type TG-215/4
can control the GP-1000 generator feeding the OIYaI
synchrocyclotron with a current of 4000 amperes. The
overall regulation slope Sp can be calculated from the
formula of page 149 where k is the D.C. amplifier gain,
S/B is the exciter slope, A is the proportionality
constant between the nominal exciting current and the
magnet current. Regulators have been made covering the
range 5-4000 amperes. When the circuits of Figs 2 and
3 are used the accuracy is 0.01 to 0.02%. When Figs 2
and 4 are used the accuracy is 0.03 to 0.05%. Actual
measurements over periods of up to 12 hours continuous
operation using potentiometer PPTV-1 show good agreement
with calculation.

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2

Joint Inst. Nuclear Research

05468
SOV/120-59-3-39/46

AUTHORS: Vasilevskaya, D. P. and Denisov, Yu. N.

TITLE: A Hall-effect Magnetometer (Magnitometr, osnovannyy
             na effekte Kholla)

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 3,
             pp 144-145 (USSR)

ABSTRACT: A piece of n-type Ge 2 x 1.5 x 0.7 mm is used to measure
          fields of strengths from 100 to 17,500 oersted to ± 1%.
          Fig 1 shows the circuit, in which '75' denotes a 75 µA meter
          and the battery has an output of 15 V. Resistance R
          serves to set the zero. The output is 4.3 µV per
          oersted with a main current of 1 mA (resistance of Ge
          in current circuit 47 ohms). The probe contains a
          thermistor and heater spiral (not shown in Fig 1), which
          raise the volume of the probe to 1.8 cm^3; the tempera-
          ture is stabilized (presumably at some value above 30°C,
          since the readings show very little temperature error in
          the range 16 - 30°C). The instrument has five ranges
          and is calibrated against a proton resonance meter.
          There is 1 figure and 3 references, 2 of which are
          Soviet and 1 English.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint
             Institute of Nuclear Research)
SUBMITTED: May 4, 1958

21(9)

AUTHORS: Vasilevskaya, D. P., Glazov, A. A., Danilov, V. I., Denisov,
             Yu. N., Dzhelepov, V. P., Dmitriyevskiy, V. P., Zamolodchikov,
             B. I., Zaplatin, N. L., Kol'ga, V. V., Kropin, A. A., ...
             Niehoslavskiy, Rybalko, V. S., Savenkov, A. L., Sarkisyan, L. A.

TITLE: Putting Into Operation a Cyclotron With a Spatially Varying
             Tension of the Magnetic Field (Zapusk tsiklotrona s prostranst-
             vennoy variatsiyey napryazhennosti magnitnogo polya)

ABSTRACT: In the present "Letter to the Editor" the authors report on
             some measurements and theoretical considerations concerning
             some parameters of the new cyclotron. In the Laboratoriya
             yadernykh problem Ob"yedinennogo instituta yadernykh issledo-
             vaniy (Laboratory for Nuclear Problems of the Joint Institute
             for Nuclear Research) in the town of Dubna the new cyclic
             accelerator was started in January 1959; this new type shows
             both an azimuthally and a radially periodically varying magnetic
             field. The diameter of the magnet of the accelerator is 1200 mm.
             The lines of constant field tension have the shape of spirals
Card 1/3   of Archimedes, $r = 16.2\,\varphi$, periodicity of the field structure:

Putting Into Operation a Cyclotron With a Spatially   SOV/89-6-6-7/27
Varying Tension of the Magnetic Field

N = 6. The mean value of the field tension increases radially
according to the relativistic mass increase of the accelerated
ions. Since the acceleration originates from the center of
the magnet the fundamental frequencies of the free oscillations
change accordingly $Q_z = 0$, $Q_r = 1$ (at r=0) to $Q_z = 0.2$,

$Q_r = 1.01$ (at r = 52 cm). It was shown theoretically that the
radial increase of the mean magnetic field tension which is
necessary for the elimination of the nonlinear resonance effect
occurring in the center of the accelerator may decrease with
increasing N, according to

$N/2^N(N-1)!$ and with an increase of the radial spacing in the
case of a fixed N as $(\lambda_1/\lambda_2)^{N-2}$. These investigation results
were taken into account in selecting the six-spiral structure
of the magnetic field in the center of which no nonlinear re-
sonance occurs. All measurements of the field tensions were
carried out by means of a nuclear magnetometer (error ± 1.5 Oe).
A resonance quarter-wave system with one D-shaped electrode
Card 2/3   was used for the ion acceleration. In the cyclotron deuterons

Putting Into Operation a Cyclotron With a Spatially   SOV/89-6-6-7/27
Varying Tension of the Magnetic Field

            were accelerated up to 12 Mev and α-particles up to 24 Mev at
            a minimum amplitude of the acceleration tension on the duant
            of 8 kv. The two methods which were used for measuring the
            energy in the case of a maximum orbital radius are briefly
            described. A picture shows the accelerating chamber of the
            cyclotron (Fig 2), another one an autograph of a neutron beam
            in the case of different radii. The investigation results prove
            the possibility of producing a relativistic cyclotron with a
            proton energy which equals that of a modern phasotron. There
            are 2 figures and 2 references, 1 of which is Soviet.

SUBMITTED: April 9, 1959

Card 3/3

S/120/60/000/01/022/051
E032/E314

AUTHOR: Denisov, Yu.N.

TITLE: Measurement of the Intensity and Gradient of Non-uniform
          Magnetic Fields Using Nuclear Magnetometers /7

ABSTRACT: The probes described in the present paper may be used
           to measure, to a high degree of accuracy, the intensity
           and gradient of very non-uniform magnetic fields. The
           main disadvantage of earlier nuclear magnetometers is that
           they cannot be used in very non-uniform fields because of
           the finite size of the specimen in which the nuclear
           resonance is observed. The admissible field gradient may
           be considerably increased if the non-uniformity of the
           magnetic field across the specimen is compensated with the
           aid of an auxiliary magnetic field having an opposite
           gradient but keeping the magnetic-field strength at the
           centre of the specimen unaltered. Such a compensating
           field can be produced with the aid of two or four suitably
           disposed current-carrying conductors, as shown in Figure 1.
Card1/3   The optimum compensation of the non-uniformity is controlled

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E032/E314

Measurement of the Intensity and Gradient of Non-uniform Magnetic
Fields Using Nuclear Magnetometers

by a rapid increase in the amplitude and a reduction in
the effective width of the nuclear magnetic resonance
signal. Figure 2a shows the signal obtained without
compensation, which is so small that it cannot be distinguished
from background. Figure 2b shows the signal for optimum
compensation of the non-uniformity of the magnetic field.
The effective width of the resonance signal shown in the
latter photograph is about 10 Oe, so that the absolute
magnitude of the magnetic field can be measured to about
0.01%. By measuring the current in the compensating
conductors, the gradient may be calculated from the
formulae given in the present paper. The construction
of the probe is shown in Figure 3, in which 5 and 6
are the specimen-container and coil and 9 are the
compensating conductors. Gradients up to 1 000 Oe/cm can
be measured.

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Measurement of the Intensity and Gradient of Non-uniform Magnetic
Fields Using Nuclear Magnetometers

There are 3 figures and 2 Soviet references.

ASSOCIATION: Ob'yedinennyy institut yadernykh issledovaniy
        (Joint Institute for Nuclear Studies)

SUBMITTED: December 24, 1958

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21.2100   78317
                                                     SOV/89-8-3-2/32

AUTHORS: Vasilevskaya, D. P., Glazov, A. A., Danilov, V. I.,
                Denisov, Yu. N., Dzhelepov, V. P., Dmitriyevskiy, V. P.,
                Zamolodchikov, B. I., Zaplatin, N. L., Kol'ga, V. V.,
                Kropin, A. A., Lyu Ne-chuan', Rybalko, V. S., Savenkov,
                A. L., Sarkisyan, L. A.

TITLE: A Cyclotron With a Spacially Varying Magnetic Field
                Intensity

PERIODICAL: Atomnaya energiya, 1960, Vol 8, Nr 3, pp 189-200 (USSR)

ABSTRACT: The paper outlines the theory of charged particle motion
                in a magnetic field with periodic structure along its
                azimuth and radius, and describes investigations per-
                formed during the years 1955-58 on a cyclotron accelera-
                tor with spiral-ridged magnetic fields at Joint Institute
                for Nuclear Research (Ob'yedinennyy institut yadernyh
                issledovaniy). The machine was built following the
                space stability theory developed at Dubno and Harwell.
                The authors first discuss the linear theory and investi-
Card 1/10   gate the particle oscillations with respect to a closed

A.Cyclotron With a Spacially Varying
Magnetic Field Intensity

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orbit for the case of the field where the extreme values of the vertical component of the magnetic field follow the spiral of Archimedes:

$$H_z = H(r)[1 + \varepsilon f(r, \varphi)]. \qquad (2)$$

$$f = \sin\left(\frac{r}{\lambda} - N\varphi\right), \qquad (7)$$

where ε is depth of magnetic field variation; $2\pi\lambda$, radial pitch; N, periodicity of magnetic field structure. The authors note that a logarithmic spiral would not be convenient. In the cyclotron under consideration the basic focusing effect was due to terms containing the ratio R/λ, which for the choice of parameters by Kerst, Hausman, and others (see ref's) exceeded unity in the whole radial region with the exception of the central part of the accelerator where the linear theory cannot be applied. The authors investigate radial and

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Magnetic Field Intensity

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vertical oscillations and discuss the limitations on
proton energies due to resonant oscillations. Next,
they note that the small parameter λ in Eqs.(2) and
(7) magnify the nonlinear effects in such accelerators
and develop equations permitting a choice of magnetic
field parameters which do not produce nonlinear reso-
nance. Experimental investigation of such resonance was
produced on a model with $N = 4$, $\lambda = 1.34$ cm, $\varepsilon = 0.02$,
and shown on Fig. 1. The location of the centers of
instantaneous orbits are denoted by points, while the
numbers indicate their radii. Theoretical computations
agree with experiments for $s > \lambda$, where s is radial
coordinate of the center of curvature. The magnetic
field of the cyclotron was then built with $N = 6$, $\lambda =
= 2.7$ cm, and $\varepsilon = 0.066$. The displacements of orbits
in this case were not larger than those due to the
higher harmonics of the magnetic field structure and
did not exceed 2 cm. The authors also discussed the
phase relations and tested them experimentally during
deuteron acceleration up to 13 mev. Minimum potential

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A Cyclotron With a Spacially Varying
Magnetic Field Intensity
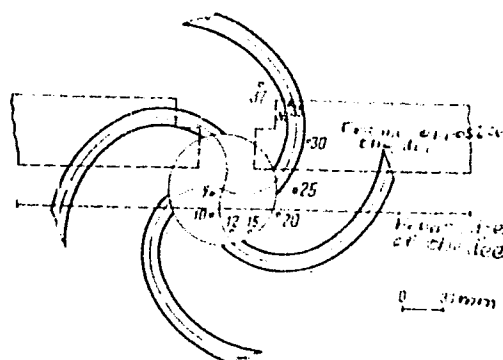
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SOV/89-8-3-2/32

Card 4/108   Fig. 1. Location of centers of instantaneous orbits
for N = 4.

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Magnetic Field Intensity

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of the dees was 5 kv. Figure 4 shows the relation
between inner beam intensity and accelerator radius with
an accelerating dee voltage of 11 kv. The beam was
well focused everywhere and the half-width of its
vertical spread was less than 1 cm. Next, the authors
describe the computations of the required magnetic field
and compare them with experimentally measured values.
Figure 7 shows results for a field with $N = 6$, $\lambda = 2.7$.
The absolute values of the field were measured using
the Hall and nuclear resonance effect magnetometers.
In the region of 250-24,000 Oersted with a 5-10%
gradient, the fields were measured with an accuracy
of $\pm 0.01\%$. Volume of the magnetometer feeler was
$2 \cdot 10^{-4}$ cm^3, and the gradients were measured with an
accuracy of $\pm 1\%$. The cyclotron magnetic field
intensity was stabilized accurately to 0.005% using a
nuclear stabilizer as described by Denisov (Pribory i
tekhnika eksperimenta (Instruments and Technics of
Experiment), Nr 1, 35 (1959)). The h-f system was
described earlier by Glazov and others (Radiochastotnaya

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A C. ..otron With a Spacially Varying
Magnetic Field Intensity

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sistema modeli tsiklotrona s prostranstvennoy variatsi-
yey magnitnogo polya, Otchet Laboratorii yadernykh
problem OIYaI (Radiofrequency System for a Model of a
Cyclotron With Spacially Varying Magnetic Field, Report
of the Laboratory of Nuclear Problems OIYaI) (1959)).
The special feature is the existence of a single dee
with a radius of 57.5 cm and a small gap between the
dees and the chamber of 1.5-2 cm. Aperture of the dee
was 4 cm. The amplitude of the acceleration potential
was stabilized to an accuracy of 1.5%. To reduce the
background due to long-lived radioactive isotopes, the
cyclotron chamber was made from the "avial" alloy.
Working vaccum was 1 to $2 \cdot 10^{-5}$ mm Hg. The ion source
was of the Penning variety and could be displaced in
arbitrary direction with affecting the vacuum. Three
quartz targets with tungsten wire served as visual or
current measuring indicators of the beam. The authors
claim that all tests confirmed the linear theory of
spacial stability of the charged particle motion in
accelerators, and that the methods of creating necessary
magnetic field variations exhibit sufficient accuracy.

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Theoretical and experimental investigation of the spac-
ially varying fields and the methods developed for
shimming the central field enable one to obtain, on
cyclotrons of appropriate size, resonant accelerations
of particles up to energies achieved until now only in
phasotrons and with beam currents of the order of
hundreds of microamperes. K. A. Baycher, N. I. Frolov,
M. F. Shul'ge, and F. V. Chumakov were the managers of
various divisions of the OIYaI engaged in the construc-
tion of the cyclotron. D. I. Blokhintsev, D. V. Yefre-
mov, K. N. Meshcheryakov, and V. N. Sergiyenko showed
interest and helped accelerate the work. E. G. Komar,
I. F. Malyshev, and L. N. Fedulov constructed the chamber
and the accelerator magnet, while A. V. Chestnyy helped
in the early stages of planning the technical problems.
There are 9 figures; and 34 references, 22 Soviet, 3 U.K.,
9 U.S. The 5 most recent U.K. and U.S. references are:
N. King, W. Walkinshow, Nucl. Instr. 2, 4 (1958);
D. Kerst, H. Hausman, R. Haxby, L. Laslett, F. Milles,
T. Ohkawa, F. Peterson, A.Sessler, J. Snyder,

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A Cyclotron With a Spacially Varying
Magnetic Field Intensity

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W. Wallenmeyer, Rev. Scient. Instrum., 28, Nr 11, 970
(1957); W. Walkinshaw, N. King, Linear Theory in S/R
Cyclotron Design, AERE, GP/R 2050 (1956); P. Dunn,
L. Mullett, T. Pickavance, W. Walkinshaw, J. Wilkins,
CERN Symposium, 1, 9 (1956); D. Derst, K. Terwilliger,
K. Symon, L. Jones, Bull. Amer. Phys. Soc., 30, Nr 1
(1955).

SUBMITTED: August 27, 1959

Card 10/10

VASILEVSKAYA, D.P.; DENISOV, Yu.N.

Device for measuring radial and azymithal components of the permanent magnetic field intensity. Prib.i tekh.eksp. 6 no.5:194-195 S-O '61.   (MIRA 14:10)

1. Ob"yedinennyy institut yadernykh issledovaniy.
            (Magnetic fields—Measurement)

VASIL'YEVSKAYA, D.P.; GLAZOV, A.A.; DENISOV, Yu.N.; DZHELEPOV, V.P.;
DMITRIYEVSKIY, V.P.; ZAMOLODCHIKOV, B.I.; ZAPLATIN, N.L.;
KOL'GA, V.V.; KROPIN, A.A.; KUZMYAK, M.; ONISHCHENKO, L.N.;
RYBALKO, V.S.; SARKISYAN, L.A.; SHVABE, Ye.; SARANTSEVA, V.R.,
tekhn. red.

[Theory and the modeling of a circular synchro-cyclotron with
a spiral magnetic field] Voprosy teorii i modelirovaniia kol'-
tsevogo fazotrona so spiral'noi strukturnoi magnitnogo polia.
Dubna, Ob"edinennyi in-t iadernykh issl., 1962.   7 p.
                                              (MIRA 15:4)
                    (Synchrotron)

VASILEVSKAYA, D.P.; VASIL'YEV, L.V.; DENISOV, Yu.N.

[Nuclear magnetometer for measuring highly non-
uniform magnetic fields] IAdernyi magnitometer dlia izme-
reniia sil'no neodnorodnykh magnitnykh polei. Dubna, Ob"-
edinennyi in-t iadernykh issledovanii, 1963. 12 p.

(MIRA 17:1)

VASILENKO, A.T.; DENISOV, Yu.N.

Electromechanical harmonic analyzer. Prib. i tekh. eksp.
8 no.6:78-81 N-D '63. (MIRA 17:6)

1. Ob"yedinennyy institut yadernykh issledovaniy.

L 25398-65   EWT(l)/EEC(k)-2/EEC-4,   Po-4/Pq-4/Pg-4/Pk-4/Pl-4

ACCESSION NR: AP5002160   S/0120/64/000/006/0125/0130

AUTHOR: Denisov, Yu. N.; Ivashkevich, S. A.

TITLE: Measuring magnetic fields by germanium transistors

SOURCE: Pribory i tekhnika eksperimenta, no. 6, 1964, 125-130

TOPIC TAGS: magnetic field measurement, germanium transistor

ABSTRACT: Based on H. A. Kampf's findings (Electronic Industries, 1960, 17, 71), an investigation of the characteristics of junction and point-contact Soviet transistors placed in a magnetic field is reported. As all transistor characteristics were found to be dependent on the magnetic-field strength to some degree, an instrument for measuring H was developed (see Enclosure 1). The circuit includes a P8 transistor mounted together with an MMT-1 thermistor in the probe; a resistor bridge circuit and an M194 multirange millivoltmeter are used for measuring the field strength. The thermistor provides a temperature

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L 25390-65
ACCESSION NR: AP5002160

compensation sufficient to ensure a 1% error of the instrument. Low sensitivity in weak magnetic fields is noted as a disadvantage. Orig. art. has: 9 figures.

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Nuclear Research Institute)

SUBMITTED: 02Dec63   ENCL: 01   SUB CODE: EM

NO REF SOV: 001   OTHER: 001

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L 16171-65   EWT(m)/EPA(w)-2/EWA(m)-2   Pab-10/Pt-10 ESD(t)/AEDC(a)/SSD/BSD/
AFWL/AFETR/IJP(c)   DM

ACCESSION NR: AP4047421   S/0089/64/017/004/0316/0318

AUTHOR: Denisov, Yu. N.

TITLE: Conference on accelerator electronics

SOURCE: Atomnaya energiya, v. 17, no. 4, 1964, 316-318

TOPIC TAGS: particle accelerator, accelerator instrumentation,
accelerator electronics, nuclear physics laboratory

ABSTRACT: An international working conference on accelerator elec-
tronics was held in Dubna, at OIYaI, in April 1964. Some 70
specialists from Bulgaria, East Germany, China, Korea, Poland,
Rumania, the Soviet Union, Czechoslovakia participated, along with
staff members of OIYaI. Thirty-two papers were delivered on the
development of new and improvement of existing electronic accelera-
tor control systems. A review paper by S. M. Rubchinskiy was de-
voted to principles of design of electronic systems for several pro-

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L 16171-65
ACCESSION NR: AP4047421

ton synchrotrons, developed at the Radiotekhnicheskiy institut AN
SSSR. A. A. Vasil'yev described the radio electronic apparatus de-
veloped at the Radiotekhnicheskiy institut AN SSSR for the cybernetic
proton synchrotron for 1 GeV. Several papers by the OIYaI staff
members concerned with many problems connected with improving the
parameters of the accelerators already in existence at the institute,
and with the development and investigation of new methods of accel-
eration of charged particles. I. B. Issinskiy reported on the oper-
ating principle and the construction of the blocks of the program-
control system for the OIYaI proton synchrotron in which several
experiments are performed in the single acceleration cycle. T. N.
Tomilina reported on the control system for the 680 MeV FM synchro-
tron of the OIYaI and on the synchronization of the experimental
installations with its operation. A. I. Mikhaylov discussed methods
for stabilization of the intensity levels when a beam of charged
particles is extracted from the OIYaI proton synchrotron, and the
factors influencing the accuracy of the stabilization system.

Card   2/7

L 16171-65
ACCESSION NR: AP4047421   6

G. S. Kazanskiy reported on simultaneous operation of two bubble
chambers in a single acceleration cycle of the OIYaI proton synchro-
tron. The chambers operate in succession. A. P. Tsarenkova pre-
sented results of an analytic and experimental investigation of a
method for increasing the proton capture coefficient in the proton-
synchrotron acceleration mode, by bunching the injected beam in a
"quasi betatron" mode using a high frequency accelerating voltage
of variable frequency. V. Sokhor (Czechoslovakia) reported on the
simulation of electrostatic fields with account of the influence of
space charge, using a resistance grid. G. P. Puchkov proposed a
method for compensating the equilibrium-phase perturbations, due to
the parasitic pulsations of the magnetic field of the proton synchro-
tron, by introducing antiphase perturbations of the beam of accel-
erated particles through modulation of the amplitude of the high
frequency accelerating voltage. I Teodoresku (Rumania) told of a
dynamic method of tuning a high frequency system and regulating the
parameters of a cyclotron accelerated-particle beam. V. G. Testov

Card   3/7

described a pulse generator for the arc of the OIYaI synchrocyclo-
tron ion source. Yu. A. Bychkov discussed the principles of con-
struction and the block diagram of a broadband telemetering system
for the control of the ion-source mode of the linear accelerator of
the OIYaI proton synchrotron. A nuclear magnetometer for precision
measurements of very inhomogeneous magnetic fields and a nuclear
magnetic field intensity stabilizer were described by Yu. N.
Denisov (OIYaI). D. P. Vasilevskaya (OIYaI) reported on the results
of prolonged experimental investigations of the characteristics of
Hall-emf transducers made of different semiconductor materials.
S. A. Ivashkevich (OIYaI) reported on the investigation of the
characteristics of several types of planar and point-junction ger-
manium transistors used as magnetic field intensity pickups. In
another paper, S. A. Ivashkevich reported on a universal portable
nuclear magnetometer built with transistors. I. Adam (OIYaI)
described a DC stabilization system, in which the current is con-
trolled by the voltage drop across a highly stabilized standard re-

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L 16171-65
ACCESSION NR: AP4047421

sistor, and the null element in the comparison circuit is a photo-
electric amplifier type F-117/1. V. G. Kunstman (NIIEFA) con-
sidered the influence of the detuning of the tank circuit of a syn-
chronized autodyne on the error in a magnetic-field stabilization
system based on nuclear magnetic resonance. K. Beyne (East Germany)
described a system for controlling the energy of a 2 MeV cascade
generator. V. Bogachek (Czechoslovakia) considered the main advan-
tages of constructing a synchrotron high frequency accelerating sys-
tem in the form of a closed waveguide. The same subject was treated
by A. I. Didenko, who presented the main results obtained at the NII
Tomskogo politekhnicheskogo instituta (TPI). K. Gamal (Czechoslo-
vakia) described the construction of a microwave ferrite insulator
based on a ferrite with 2 H = 8 x 10^4 A/m and M = 1.8 x 10^5 A/m.
M. Pakhan and A. Mekler (Poland) described the characteristics of
a high frequency system and different magnetic systems of a 10 MeV
proton linear accelerator, now under construction in Swierka.
V. S. Panasyuk reported on the construction and characteristics of

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L 16171-65
ACCESSION NR: AP4047421   6

tunable microwave cavities for the high frequency section of an
iron-free proton synchrotron under development at the Institut
yadernoy fiziki Sibirskogo otdeleniya AN SSSR. V. G. Shestakov de-
scribed high power pulse voltage in current generators developed
at TPI. I. Teodoresku reported results of an investigation of the
acceleration of relativistic and nonrelativistic charge particles
by a single resonator during the time of flight with a time of
flight close to half the high-frequency period. S. Pepurianu
(Rumania) proposed in his paper an installation for remote measure-
ments of the positions of the dees in a cyclotron vacuum chamber.
P. T. Shishlyannikov, V. I. Prilipko, and V. M. Lachikova (OIYaI)
reported on two types of electron-counter frequency meter and fast
semiconductor scalar circuits for them, developed at the Laboratory
for Nuclear Problems.

ASSOCIATION: Ob"yedinenny*y institut yaderny*kh issledovaniy
(Joint Institute of Nuclear Research)

Card   6/7

L 16171-65
ACCESSION NR: AP4047421

SUBMITTED: 00

SUB CODE:

NR REF SOV: 000

ENCL: 00

OTHER: 000

Card 7/7

L 45423-65   EWT(1)/EEC(m)/EWT(m)/EEC(k)-2/EWA(b)   Po-4/Pq-4/Pg-4/Peb/P1-4/
P1-4   DIAAP
ACCESSION NR: AP5007052   S/0120/65/000/001/0174/0177

AUTHOR: Vasilevskaya, D. P.; Vasil'yev, L. V.; Denisov, Yu. N.

TITLE: Nuclear magnetometer for measuring strongly nonuniform magnetic fields

SOURCE: Pribory i tekhnika eksperimenta, no. 1, 1965, 174-177

TOPIC TAGS: magnetometer, nuclear magnetometer

ABSTRACT: A nuclear magnetometer is described in which the nonuniformity of
the magnetic field being measured is compensated by another magnetic field with
an opposite gradient in such a way that the magnetic-field strength in the vial
center remains invariable. The vial contains an active substance. The
quadrupole-type compensating field is created by a current flowing in the
conductors of definite size and shape. The results of field calculations for two
types of the current quadrupoles are reported. The vials and quadrupole used for

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L 15423-65
ACCESSION NR: AP5007052

measuring the fields over 3×10^5 amp/m are shown, as well as the principal connection diagram of the magnetometer. The instrument can be used for precision measurement of magnetic fields with a gradient up to 1000—3500 oe/cm. Orig. art. has: 5 figures and 4 formulas.

ASSOCIATION: Ob''yedinennyy institut yadernykh issledovaniy (Joint Nuclear Research Institute)

SUBMITTED: 02Dec63   ENCL: 00   SUB CODE: NP, ES

NO REF SOV: 003   OTHER: 000

Card 2/2

L 47074-66   EWT(1)/EEC(m)/EEC(k)-2 EWA(h)   Pc-4/Pq-4/Pg-4/Psb/P1-4/P1-4

ACCESSION NR: AP5011878   UR/0120/65/000/002/0094/0100

AUTHOR: Gavrish, P. P.; Denisov, Yu. N.; Komissarov, A. G.;
Lachinov, V. M.; Prilipko, V. I.; Susov, Yu. I.; Shidlyannikov, P. T.

TITLE: Wide-range automatic electronic-counter frequency meter

SOURCE: Pribory i tekhnika eksperimenta, no. 2, 1965, 94-100

TOPIC TAGS: frequency meter, electronic frequency meter

ABSTRACT: An electronic-counter-type frequency meter is described which is
intended for measuring the frequency of sinusoidal or pulse signals within the
0.1—100-Mc range. Measurements can be made either automatically every 5—30
sec or sporadically by pushbutton. The digital-type instrument operates from
0.05—1 v at its input, displays the results on decade tubes, and can also deliver a
binary-decimal code suitable for computers. The frequency meter can be used
not only for direct frequency measurement but also in conjunction with a nuclear

Card 1/2

L 47074-65

ACCESSION NR: AP5011878

magnetometer for precision measurement of magnetic field strength. A block diagram and circuit diagrams of the amplifier, a 1-Mc reference crystal oscillator, a cold-cathode-tube relaxation generator, frequency dividers, counter decades, an output-to-printer unit, and a clock-frequency decade unit are presented. Orig. art. has: 7 figures and 1 formula.   [03]

ASSOCIATION: Ob"yedinennyy Institut yadernykh issledovaniy (Joint Institute of Nuclear Research)

SUBMITTED: 06Mar64   ENCL: 00   SUB CODE: EC

NO REF SOV: 003   OTHER: 000   ATD PRESS: 4001

Card 2/2

L 58913-65   EWT(m)/EPA(w)-2/EWA(m)-2   Pt-7   IJP(c)   GB

S/0000/64/000/000/0547/0555

ACCESSION NR: AT5007938

AUTHOR: Glazov, A. A.; Denisov, Yu. N.; Dmitriyevskiy, V. P.; Zamolodchikov, B.I.; Zaplatin, N.L.; Kol'ga, V. V.; Komochkov, M. M.; Kropin, A. A.; Dzheleppv, V. P.; Gashev, M. A.; Malyshev, I. F.; Monoszon, N. A.; Popkovich, A. V.

TITLE: Relativistic 700-Mev proton cyclotron

SOURCE: International Conference on High Energy Accelerators. Dubna, 1963. Trudy. Moscow, Atomizdat, 1964, 547-555

TOPIC TAGS: proton accelerator, relativistic particle

ABSTRACT: Current theoretical concepts and experimental data conclusively show that to understand the microcosm further it is necessary to increase the beam intensity of accelerators by a factor of 10^3 and produce accelerators with energies up to thousands of Bev's. For the past 5-6 years constant gradient accelerators (500-900 Mev cyclotrons) have appeared to be the best way to produce particles with energies up to 1 Bev (1 Gev) with beam currents of the order of 1 milliampere instead of 1 microampere (as found in synchrocyclotrons). The present report describes the design for a 700-Mev proton cyclotron developed by the Laboratory of Nuclear Prob-

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L 58913-65

ACCESSION NR: AT5007938

blems of the OIYaI jointly with the NIIEFA GKAE SSSR and other scientific research institutes with rated current proton beam up to 500 microamperes. The choice of energy was made on the basis of the fact that at 700 Mev the cross-sections for formation of pions in nucleon-nucleon and nucleon-nuclei collisions are close to maximum, and also because of the possibility of utilizing the electromagnet of the 680-Mev synchrocyclotron of the OIYaI for the new accelerator. The following new problems were considered in the design because there is now no similar operational high-energy accelerator: (a) verification of the linear theory and development of the nonlinear theory of spatial stability and of the phase motion of particles in the accelerator; (b) creation in a large space of a magnetic field with complex configuration and its stabilization with an unusually high degree of accuracy; (c) production of apparatus for the measurement of strongly nonhomogeneous magnetic fields (gradients up to 4000 oe/cm) with an accuracy better than 10^4; (d) production of high-frequency oscillators with power up to 2 MW at a frequency of 12 megacycles per second (12 Mc), with frequency stability of the order of 10^{-5}, which operate with a resonance system with amplitude of the accelerating high-frequency voltage of up to 100 kilovolts; (e) design of an accelerator and its auxiliary systems which ensure effective operation and maintenance under conditions of high levels of activity; (f) development of a highly effective system for the channeling of proton beams from the accelerator, and also solution of the problems connected with

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L 58913-65

2

ACCESSION NR: AT5007938

producing beams of secondary particles and their channeling and focusing; (g) development of plans for the protection of personnel and instruments from radiation. The paper concludes that the relativistic cyclotron offers wide new possibilities for nuclear research in radiobiology, solid state physics, etc. Orig. art. has: 7 figures, 3 tables.

ASSOCIATION: (I) Ob"yedinennyy institut yadernykh issledovanniy, Dubna (Joint Institute of Nuclear Research, Dubna); (II) Nauchno-issledovatel'skiy institut elektrofizicheskoy apparatury imeni D. V. Yefremova GKAE SSSR (Scientific Research Institute of Electrophysical Equipment, GKAE SSSR)

SUBMITTED: 26May64   ENCL: 00   SUB CODE: NP

NO REF SOV: 009   OTHER: 002

Card 3/3

L 56660-65   EWT(1)/EPF(c)/EEC(t)   P1-4   IJP(c)   WW/GG
ACCESSION NR: AP5011885   UR/0120/65/000/002/0134/0135
                                              532.1.978

AUTHOR: Denisov, Yu. N.; Kalinichenko, V. V.

TITLE: Resonator for observation of the electron paramagnetic resonance in the
decimeter band

SOURCE: Pribory i tekhnika eksperimenta, no. 2, 1965, 134-135

TOPIC TAGS: electron paramagnetic resonance, decimeter band

ABSTRACT: A quarter-wave coaxial resonator with a helical internal conductor
is suggested for observing the electron paramagnetic resonance (EPR) in the
decimeter band. In such a resonator, the r-f magnetic field is highly concentrated
inside the helical conductor which provides a high fill factor η for small-volume
specimens. The intensity of the EPR signal in this type of resonator is dozens of
times higher than that of a volume-type coaxial resonator. The details of a new
2-Ge $Q_0 = 400$ resonator are given. Orig. art. has: 2 figures and 6 formulas.

Card 1/2

L 56660-65
ACCESSION NR: AP5011885

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy (Joint Nuclear
Research Institute)

SUBMITTED: 13Feb64   ENCL: 00   SUB CODE: EC, NP

NO REF SOV: 001   OTHER: 002

Card 2/2

DENISOV, Yu.N.; ZALOGIN, G.N.; KALASHNIKOV. V.K.

Flow near the critical point with magnetic fields parallel with
and perpendicular to the body surface. Mag. gidr. no.3:81-86
'65.

(MIRA 18:10)

VASILEVSKAYA, D.P.; VASIL'YEV, L.V.; DENISOV, Yu.N.

Nuclear magnetometer for measuring highly inhomogeneous magnetic fields.
Prib. i tekh. eksp. 10 no.1:175-177 Ja-F '65.   (MIRA 18:7)

1. Ob"yedinennyy institut yadernykh issledovaniy.

L 14233-66   EWT(1)/EWP(m)/EWA(d)/FCS(k)/EWA(1)

ACC NR: AP5024906   UR/0382/65/000/003/0081/0086 /3

AUTHOR: Denisov, Yu.N.; Zalogin, G.N.; Kalashnikov, V.K.   /2

ORG: None

TITLE: Flow in the viscinity of a critical point, with magnetic fields either paral-
lel or perpendicular to the body surface

SOURCE: Magnitnaya gidrodinamika, no.3, 1965, 81-86

TOPIC TAGS: magnetohydrodynamic theory, magnetized plasma flow, hypersonic magnetized
plasma flow

ABSTRACT: A two-dimensional, non viscous, hypersonic, constant density and finite con-
ductivity/gas flow is studied behind the departed shock wave in front of a magnetized
cylindrical body. The cases of a magnetic field parallel to the body surface and per-
pendicular to it are analyzed separately. In the viscinity of the critical point, the
shock wave is assumed to be coaxial with the body. For a negligible magnetic Reynold's
number, the non-dimensional system of equations becomes (asterisks designate dimensio-
nal quantities)

$$\mathrm{grad}\left(kP+\frac{U^2}{2}\right)-U\times\mathrm{rot}\ U=Sk\ [U\times H]\times H'(1)\ ; \quad \mathrm{div}\ U=0, \qquad (2)$$

where $k=\rho^*/\rho^*$ – ratio of densities, $S=\sigma^*B_0^{*2}\ R_b^*/\rho^*U_\infty^*$ – parameter of magnetohydrodynamic

Card 1/2   UDC 538.4

L 14233-66

ACC NR: AP5024906

interaction; $P=p*/\rho_{\infty}* U^2$; $U=U*/U*$; $H=H*/H*$; $r=r*/R_{b}$ - are, respectively, the non-dimensional pressure, velocity, magnetic field intensity and the polar coordinate. After suitable transformations, the computer programmer is presented with the differential equation (3) for $\varphi(y)$, closely related to a basic assumed component of the velocity potential function $\psi(r,\theta)$, with the initial conditions (4):

$$\varphi'''\varphi(1-ky)^3 - \varphi\varphi''k(1-ky)^2 - \varphi\varphi'k^2(1-ky) - 2k^3\varphi^2 + k(\varphi')^2(1-ky)^2 - \varphi'\varphi''(1-ky)^3 = Sk^3\varphi; \quad (3)$$

$$\varphi=1; \quad \varphi'=-1; \quad \varphi''=1-3k+2k^2 \quad (4)$$
$$\text{for } y = 0$$

A similar analysis is performed in the case of magnetic field perpendicular to the surface of the cylindrical body. The results of computer calculations, performed with the utilization of the Runge-Kutta approximation technique, showed that the parallel magnetic field has no substantial influence on the gas flow. The perpendicular magnetic field, in aggreement with known experimental data on the flow around a magnetized sphere, has been found to exert a considerable influence on the flow pattern. Authors thank prof. A.B. Potapov for his review of the paper and for his comments. Orig. art. has 4 figures, 16 formulas.

SUB CODE: 20.   SUBM DATE: 06Dec64/   ORIG REF: 004   OTH REF: 001

Card 2/2

ADAM, I.; DENISOV, Yu.N.; KOKESH, A.; CHUMIN, V.G.; SHISHLYANNIKOV, P.T.

System for automatic measurement fo conversion electron spectra using a magnetic β-spectrometer. Izv. AN SSSR. Ser. fiz. 29 no.12:2147-2156 D '65.
(MIRA 19:1)

1. Laboratoriya yadernykh problem Ob"yadinennogo inst'tuta yadernykh issledovaniy i Institut yadernykh issledovaniy Chekhoslovatskoy Akademii nauk.

L 20721-66   EWP(j)/EWT(l)/EWT(m)   RM/WW/JW

ACC NR: AP6007830   SOURCE CODE: UR/0120/66/000/001/0158/0162

AUTHOR: Denisov, Yu. N.; Ivashkevich, S. A.; Kalinichenko, V. V.

ORG: Joint Nuclear Research Institute (Ob'yedinennyy institut yadernykh issledovaniy)

TITLE: Magnetic field stabilizer with a broadband EPR sensor

SOURCE: Pribory i tekhnika eksperimenta, no. 1, 1966, 158-162

TOPIC TAGS: EPR, stabilizer

ABSTRACT: Previously used NMR sensors included electron tubes, transistors, and
other short-life parts; such sensors could hardly be used in large permanent
installations because of their inaccessibility for purposes of maintenance (tube
replacements, etc.). Hence, a new type of sensor — a broadband EPR sensor — has
been developed. In this sensor, only a specimen-containing absorption chamber and
modulating coils are placed in the field of the magnet being stabilized. The SHF
oscillator and signal recording equipment can be placed at a considerable distance
from the magnet and connected with the chamber by means of a waveguide. The
broadband chamber consists of a length of rectangular waveguide shorted by a choke

Card 1/2   UDC: 539.283:621.316.73

L 20721-66

ACC NR: AP6007830   c2

plunger. The EPR signal (with a diphenylpicryl hydrazyl specimen) exceeds the NMR signal by thousands of times. Fields of 0.6—1.37-tesla can be stabilized. With a prestabilization of the magnet current within $(1-5) \times 10^{-2}$ %, the instability of the field is $(1-3) \times 10^{-3}$ % or less. A sketch of the sensor and principal electronic circuits are presented. Orig. art. has: 5 figures, 6 formulas, and 2 tables. [03]

SUB CODE: 18, 09 / SUBM DATE: 09Feb65 / ORIG REF: 003 / OTH REF: 004

ATD PRESS: 4223

Card 2/2

L 06124-67   EWT(1)   SOURCE CODE: UR/0120/66/000/003/0107/0114

ACC NR: AP6022005

AUTHOR: Denisov, Yu. N.; Komissarov, A. G.; Prilipko, V. I.; Susov, Yu. I.;
Shishlyannikov, P. T.

ORG: Joint Nuclear Research Institute, Dubna (Ob"yedinennyy institut yadernykh
issledovaniy, Dubna)

TITLE: Electron-counting system for stabilizing frequency of r-f oscillators

SOURCE: Pribory i tekhnika eksperimenta, no. 3, 1966, 107-114

TOPIC TAGS: rf oscillator, electronic oscillator, frequency stability

ABSTRACT: The development of a new apparatus is reported which automatically sets
and maintains the frequency of an oscillator within 0.00$\%$ in a 1--100 Mc band. The
time Δt_T necessary for filling a counting decade (1 through 6, adjustable) register
with the pulses recurring at a frequency f_x is compared with a reference time inter-
val Δt_r. The comparison results in an error signal which adjusts, through a
feedback channel, the parameters of the oscillatory circuit in such a way that
$f_x = N/\Delta t_r$, where N is the number of pulses required for filling the register.
The register capacity varies due to clearing (before each filling) not to zero, but to
$N^\prime = N_m - N$, where N_m is the maximum capacity of the register. Thus, when $N^\prime$ varies,
f_x also varies always remaining $f_x = (N_m - N^\prime)/\Delta t_r$. The frequency error is corrected

UDC: 621.373.023:621.373.078.6

Card 1/2

L 06124-67

ACC NR: AP6022005

"coarsely" by a servomotor-operated main capacitor of the oscillatory circuit and "finely" by an additional varicap in the same circuit. If the reference time interval is 1 sec, the value of $N_m - N'$ is in cps. In NMR apparatae, the value of $N_m - N'$ can be expressed directly in teslas or oersteds. The frequency stabilizing system is designed for a 1--10-Mc band (or 0.0235--0.2350 teslas). An additional high-speed decade is used to widen the frequency band to 100 Mc (or 2.35 tl). Principal circuit diagrams of the apparatus and its component parts are explained. Orig. art. has: 9 figures and 5 formulas.

SUB CODE: 20, 09 / SUBM DATE: 08Jun65 / ORIG REF: 002

L 08497-67   EWT(1)/ECC   IJP(c)   G/ SOURCE CODE: UR/0120/66/000/005/0203/0206

ACC NR: AP6034239   (N)

24

AUTHOR: Vasilevskaya, D. P.; Denisov, Yu. N.; D'yakov, N. I.

ORG: Joint Institute of Nuclear Research, Dubna (Ob"yedinennyy institut yadernykh issledovaniy)

TITLE: A precision Hall magnetometer

SOURCE: Pribory i tekhnika eksperimenta, no. 5, 1966, 203-206

TOPIC TAGS: magnetometer, Hall effect

ABSTRACT: A magnetometer based on the Hall effect is described which comprises a thermostatically controlled InPAs Hall voltage detector 1.8 x 1.2 x 0.3 mm) in size (1), a Hungarian El49 ultra-sensitive thermostat(2), a stabilized current supply (3), a compensating circuit (4), and a potentiometer (5) (see Fig. 1). The thermostat, which is connected to the detector casing by two insulated rubber hoses, controls the temperature of the detector by circulating water around it. Detector temperature varies no more than ±0.2—0.3C for ambient temperature changes of ±5C and hose lengths of 7 and 14 m. The maximum measurement error for temperature changes of ±5C does not exceed 0.008—0.012%. The stabilized current supply provides excitation current (nominal value, 50 mamp) to the detector. This current is kept constant within about
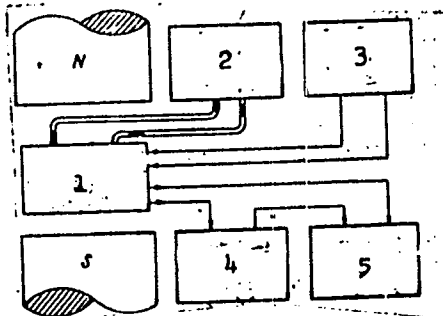
UDC: 621.317.444

Card 1/2

L 08497-67

Fig. 1.   Magnetometer block diagram

1 - Hall voltage detector; 2 - ultra-sensitive thermostat; 3 - stabilized current supply; 4 - compensating circuit; 5 - potentiometer.

$10^{-3}\%$ by placing the critical control elements, which include a precision resistor used to generate a reference voltage and a comparison bridge, in the thermostat. The difference between the detected Hall voltage and the voltage across the precision resistor is measured with the potentiometer. The overall RMS measurement error, including calibration error, does not exceed 0.05%. The circuit, used since 1962, is built with solid-state components and can measure both uniform and varying magnetic fields with gradients up to 30 T/m. Orig. art. has: 4 figures.

SUB CODE: 08/ SUBM DATE: 12Nov65/ ORIG REF: 006/ ATD PRESS: 5103

Card 2/2 afs

L 08573-67   EWP(m)/EWT(1)/EWT(m)   WW/JW/JWD/WB

ACC NR: AP6033492   SOURCE CODE: UR/0413/66/000/018/0115/0115

INVENTOR: Grishin, S. D.; Gusev, V. I.; Denisov, Yu. N.; Mironov, S. G.; Serbinov, A. I.; Troshin, Ya. K.

ORG: none

TITLE: Shock tube for determining the ignition induction period of combustible mixtures. Class 42, No. 186166

SOURCE: Izobret prom obraz tov zn, no. 18, 1966, 115

TOPIC TAGS: shock tube, fuel ignition, fuel ignition induction period, air fuel combustion

ABSTRACT: The proposed shock tube for determining the ignition induction period of combustible mixtures contains a test section and a section separated by a membrane for initiating the detonation. In order to decrease the size of the shock tube, the section for initiating the shock is made in the form of a helix (see Fig. 1). Orig. art. has: 1 figure.
                                                          [WA No. 68]

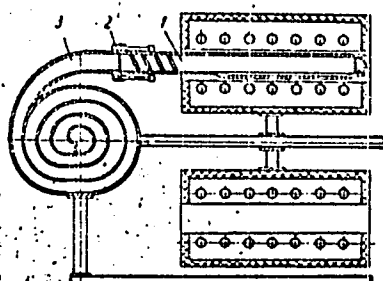Card 1/2   UDC: 534.222.2.002.51

L 08578-67

ACC NR: AP6033492

Fig. 1. Shock tube

1 - Test section; 2 - membrane;
3 - section for initiating det-
onation.

SUB CODE: 21/ SUBM DATE: 08Jun65

L 2456-66   EWT(1)/EWA(h)

ACCESSION NR: AP5021336

UR/0120/65/000/004/0083/0090
621.382.2/.3:621.374.32

AUTHOR: Denisov, Yu. N.; Lachinov, V. M.; Prilipko, V. I.

TITLE: High-speed counter circuits using transistors and tunnel diodes

SOURCE: Pribory i tekhnika eksperimenta, no. 4, 1965, 83-90

TOPIC TAGS: pulse counting, frequency divider, tunnel diode, counting circuit

ABSTRACT: A description is given of several high-speed time-interval and frequency counter circuits. These include: 1) a transistorized decade counter. Transistor cutoff frequency is 200 Mc, and current gain is 60—80. The maximum counting rate is 30 Mc. 2) A five-stage ring circuit. The circuit utilizes series-connected tunnel diodes to form a decade counter capable of 180—200 Mc counting rate. However, a ±5% change in bias voltage disrupts counter operation. 3) A hybrid transistor-tunnel diode decade counter. Counting rate can be as high as 180—200 Mc. The components, however, must be preselected with an accuracy of 1%. 4) A decoder-indicator circuit. The circuit employs IN-1 or IN-2 indicator tubes with firing voltage of 135 v and extinction potential of not less than 110 v. The transistors act simultaneously as tube control elements and decoders of decade-counter infor-

Card 1/2

L 2456-66

ACCESSION NR: AP5021336

mation. 5) A synch pulse generator for extension of the useful range of oscillo-
scopes with a 150-Mc bandwidth. Nanosecond pulses with 20-kc repetition rate are
generated. Orig. art. has: 11 figures and 2 formulas.   [BD]

ASSOCIATION: Ob"yedinennyy institut yadernykh issledovaniy, Dubna (Joint Institute
of Nuclear Research)

SUBMITTED: 19Jun64   ENCL: 00   SUB CODE: EC

NO REF SOV: 001   OTHER: 004   ATD PRESS: 4106

BVK

Card 2/2

3(7); 7(7)   PHASE I BOOK EXPLOITATION   SOV/2080

Denisov, Yuriy Stepanovich

Radiotekhnika v artilleriyskoy meteorologii (Radio Engineering in Artillery
    Meteorology) Moscow, Voyenizdat M-va oborony SSSR, 1958. 92 p. Number of
    copies printed not given.

Ed.: I. G. Kulikov, Engineer, Lt. Colonel; Tech. Ed.: Ye. K. Konovalova.

PURPOSE: This booklet is intended for officers, students of military academies,
    and nonprofessional persons interested in the use of radio equipment in
    meteorology.

COVERAGE: The booklet, written on a nonprofessional level, explains the
    structure of the atmosphere and its influence on the basic processes of artil-
    lery firing. Special attention is given to equipment, especially radio equip-
    ment of the meteorological service. No personalities are mentioned. There are
    no references.

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Yu.S., red.; MEDNIKOVA, A.N.

[Antiradar measures] Protivoradiolokatsiia. Moskva, Voen.izd-vo
M-va boro..SSSR, 1960. 134 p.   (MIRA 13:3)
                              (Radar)